Teaching 'Diversity in Design and the Design Thinking Process through hands-on in-classroom prototyping (Resource Exchange, Diversity)

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Resource Exchange – Handout

Title:	Teaching 'Diversity in Design' and the Design Thinking Process through hands-on in-classroom prototyping
Target Grade Level:	6-8
Target Age Range:	11-14
Expected Time-Frame	2 hours
Learning Objectives:	Design Thinking, Engineering Design, Diversity
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Activity Summary

This activity is designed to introduce the design thinking process, while also allowing fostering awareness of the importance of diversity. The activity is targeted towards grades 6-8 students (ages 11-14) but can be adjusted and modified for younger or older audiences.

The purpose of this activity is to help students understand the importance of empathy for a customer in design, as well as understanding how diversity can help create more innovative products.

Students will be introduced to the steps in the design thinking processes as well as some of the challenges currently faced in design for diverse populations.

Students will then be split into groups and randomly assigned a 'task', a problem they need to solve, as well as a 'customer', who they are solving the problem for.

Students will have the opportunity to go through the steps of the design thinking process to build a prototype. Materials for the prototype can include different materials available to the teacher and can be modified accordingly. Previous implementations have used littlebits along with various craft supplies.

The project could potentially be extended into a longer exercise where students have the opportunity to go out into the community and test their prototypes with potential customers, or scaled into an entrepreneurship activity where students launch their product as a business idea.

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that fosters awareness, increases engagement and inspires the use of STEM in our daily lives.

Background

Below are some links to potential discussion points on challenges and opportunities for diversity in design. Additional topics can be discussed based on differing demographics (e.g. focus on women, focus on differing abilities, focus on economic status, focus on differing cultures, etc.)

- Teenager finds flaw in hand dryer design
  https://www.cbc.ca/news/canada/calgary/calgary-student-nora-keegan-hand-dyer-research-decibel-1.5185853
  Student discovers that hand dryers may be harmful to children's hearing as children have to stand too close due to their height and length of arms
- Improper Design of Cars for Women
  https://jezebel.com/women-are-dying-in-car-accidents-because-the-only-femal-1836527298
  Most cars not being designed with women in mind and can lead to safety implications for women, designs also rarely consider women of different sizes or pregnant women
- Bias in the design of artificial intelligence
  https://www.usatoday.com/story/tech/2019/04/17/ai-too-white-male-more-women-minorities-needed-facial-recognition/3451932002/
  Facial recognition software has difficulty recognizing darker skin tones, AI based recruitment tools discriminate against women
- Brainstorming better diversity in design
  https://www.theguardian.com/commentisfree/2018/aug/27/architects-diversity-cities-designed-mothers
  Looking at ways we might design a city if it including designers who were mothers, teens, or older persons.

**Additional information containing handouts for students to complete the Diversity in Design activity can be found on the BrainSTEM Alliance website or by contacting info@brainstemalliance.com .

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